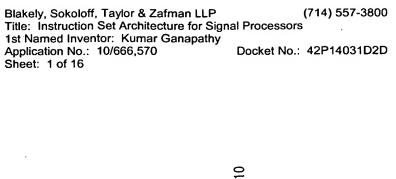
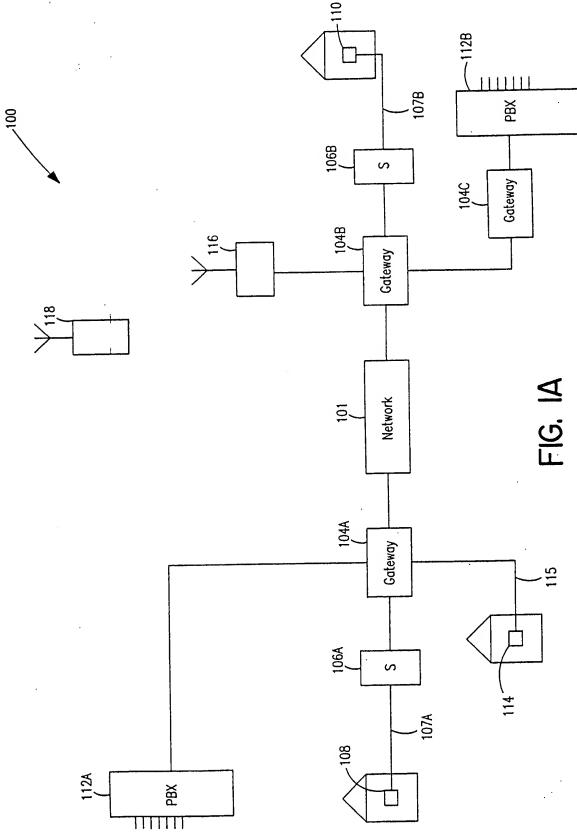
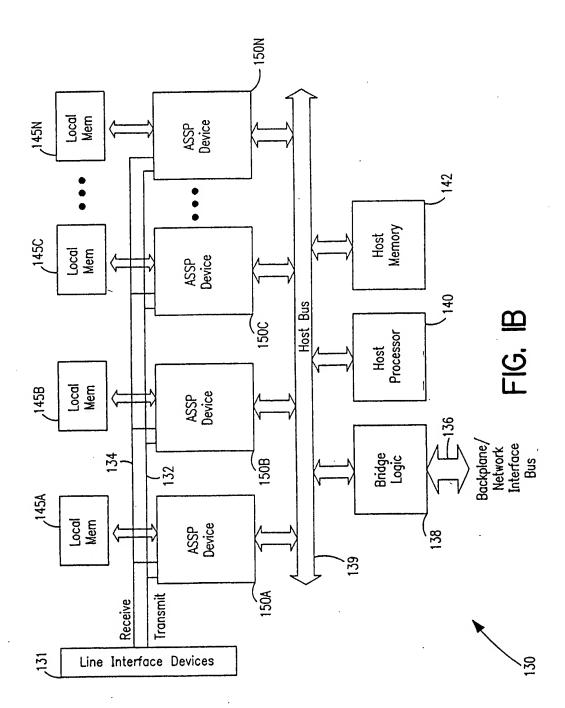
(714) 557-3800

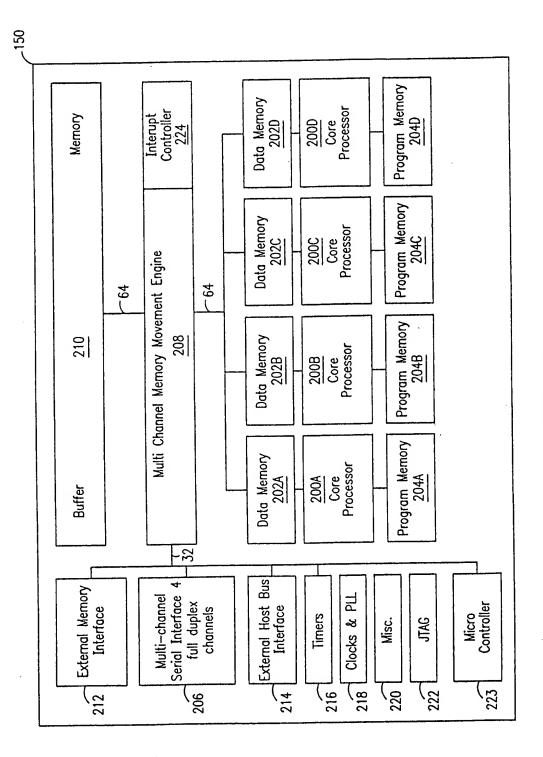




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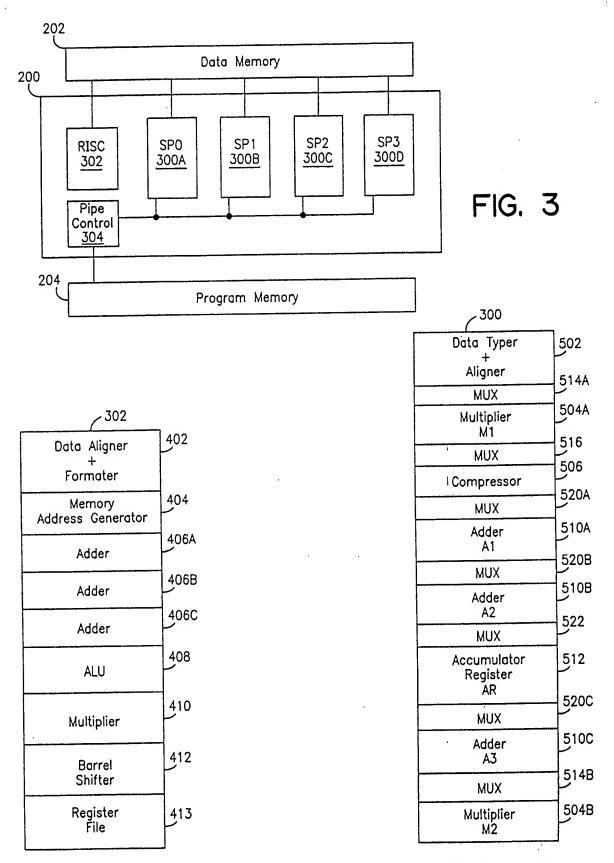


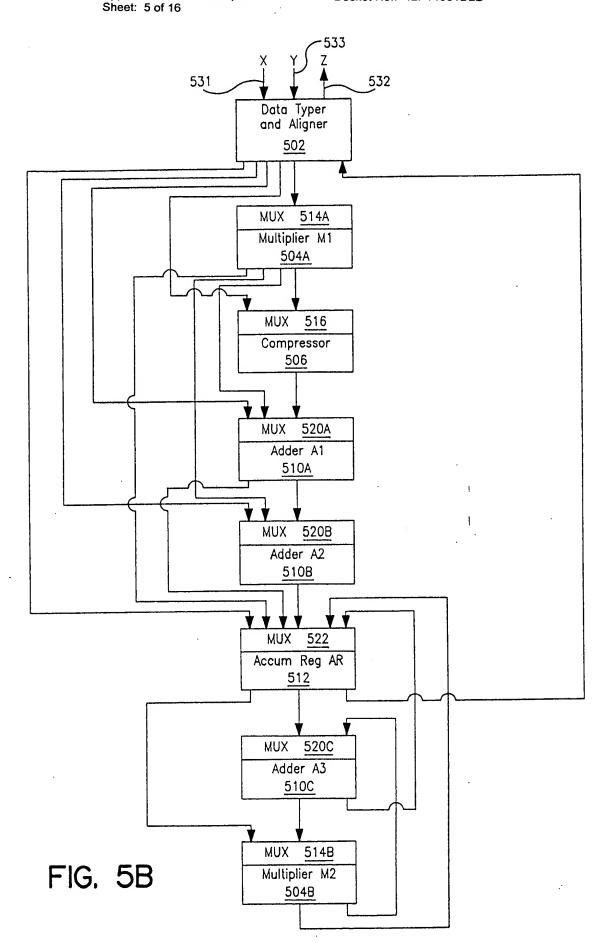
FIG. 4

FIG. 5A

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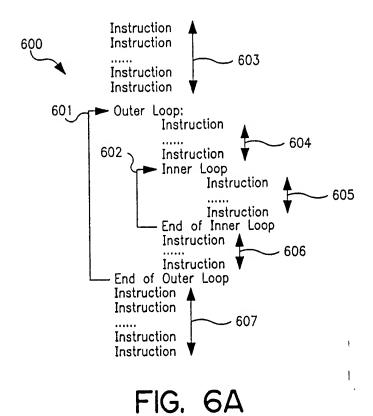
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610 612 611 MAIN' OP SUB OP MULT NOP MIN/MAX ADD MIN/MAX ADD **MULT** NOP

FIG. 6B

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30 29 28 27 26 25 24 23 22 21 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0 SY V/\$ SA DA Sub-op 1 Pred PL Sxt Syt Rnd S' S' 0 SA DA abs 0 0 *5y Nop 0 0 0	<u> </u>)C	dd da=+/- (mx'sa)+my du da=+/- (mx'sa)+my du
120 19 1 -op 1		FIG. 6C	. <u>*</u> * Ø
25 24 23 22 21 20 V/\$SA DA Sub-op Nob	000	Ē	25 24 23 22 2 V/SSA DA 0
6 25 24 3 V/\$SA [Add Add Sub Min Min Min		262524 N/\$SA
39 38 37 36 35 34 33 32 31 30 29 28 27 26 1 0 0 PS S' SX SY da=+/- sx*sy	$da=+/-(sx^*sy)+sa$ $da=+/-(sx^*sy)+sa$ $da=+/-(sx^*sy)-sa$ $da=+/-(sx^*sy)-sa$ $da=min(+/-sx^*sa,sy)$ $da=min(+/-sx^*sa,sy)$ $da=max(+/-sx^*sa,sy)$		39 38 37 36 35 34 33 32 31 30 29 28 27 26 25 24 23 22 21 20 1 0 0 PS S' SX SX 00 00

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20-bit ISA

39	19	
0	0	20-bit parallel
0	1	20-bit serial
1	0	40-bit extended
1	1	20-bit serial

Control () Control Control # Control DSP extensions/Shadow DSP # DSP

DSP instructions

	39 38 37 36 35 34 33 32 31 30 29 28 27 26 25 24 23 22 21 20
Multiply	1 0 0 PS S' SX SY V/SSA DA Sub-op 0 0 0 Nop
	90-55 of
	00-(5x 3)/100
	00-(3, 50) 15)
	00-(3x 3y)130
	00-(5x 50/13)
	dd-1111(3x 8),30)
	dd=min(sx sd,sy)
	da=max(sx*sy,sa)
Add	1 0 1 PS +/- SX SY V/SSA DA Sub-op
	da=sx+sy
	da=sx+sy+sa O O 1 Add
	da=sx+sy: $sa=sx+sy$: 0 1 0 AddSub
	da=(sx+sy)*sa
	$da = -(sx + sy)^*sa$
	da=min(sx+sy,sa)
	da=max(sx+sy,so)
	da=ssum(sa) (sx,sy unused) 1 1 1 CombAdd
Extremum	1 1 0 PS x/n SX SY V/SSA DA Sub-op
	dg=ext(sx,sy) 0 0 0 Nop
	da=ext(sx,sy,sa) 0 0 1 Ext
	$da=ext(sx,sa)^*sy$ 0 1 0 Mul
	$dq = -ext(sx,sq)^* sy \qquad \boxed{0 \ 1 \ 1} MulN$
	da=ext(sx,sa)+sy 1 0 0 Add
	da=ext(sx,sa)-sy 1 0 1 Sub
	ext(sa,da) ?1=sx,tr=sy,lcs=lc
type-match	1 1 0 PS 0 SX SY X X X 1 1 1
Permute	1 1 0 PS 1 SX Type x ereg 1 1 1 Permute
Reserved	1 1 1 PS x SX SY SA DA V/S Sub-op

FIG. 6E-I

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Shadow DSP

0 Оp

19 18 17 16 15 14 13 12 11 10 9

ОР

ereg

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Control and specifier Extensions 19 18 17 16 15 14 13 12 11 10 9 8 6 4 5 O SADA abs 0 Mul Pred Rnd Add/Sub min/max Gx O SA DA abs O PL Syt Sub-ext Pred Sxt Add Nop (uadd) Mul/MulN x V/SRnd Fp Min/Max tr-ctl Gx Sub-ext 0 SA DA abs 0 0 Ext 0 Pred PL Sxt Add/sub Mul 0 | ereg |Pcll 0 | Pctl1 Syt Pred PL Sxt Type/offset/permute extensions 6 19 18 17 16 15 14 13 12 11 10 Type override Type:SY Type:SX 0 Pred permute override 0 SA DA Psy 1 0 Permute:SY Psx Permute:SX Pred PL Offset override O SAIDA pry Offset:SY Offset:SX 0 Pred

FIG. 6E-2

8

ereg

5

1 SA DA Sub-op

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Control instructions

Control instructions																	
1	19	18 17	16	15	14	13 12 11 10	9	8	71	6	5	4	3	2	1	0	
add,sub		Pred	Ö	0	0	RX		R'				R2			+/-	0	
max,min		Pred	ō	Ō	0	RX		R'				RZ			X/N	1	
Shift		Pred	0	0	1	RX		Ul				RZ					<bit1,bits9-6></bit1,bits9-6>
Logic		Pred	0	1	0	RX		R'				RZ				<u>&1</u>	==UI5 (Shift
Mux	Ĩ	Pred	0	1	1	RX		R'				R2			Pd	힞	Amount)
mov	Ī.	Pred	0	1	1	RX		D			Rxt		0	0	0	1	•
addi		Pred	0	1	1	S14		D			X.	X	1	О	0	1	
mov2erq		Pred	0	1	1	RX	ur		ere	_ و	gd	tyr	<u>e</u>	1	0	-1-1	
l.dm		Pred	0		1	RX		D7				DŻ			1	1	
Set4bits	L	Pred	1	0	0	UI4:POS		R			Rzt			<u> </u>		0	
Set2bits		Pred	1	0	0	UI4:POS		R			Rzt	Ul		0	0	1	2017 DH-17
Setbit	L	Pred	1	0	0	UI4:POS		R	<u> </u>		Rzt	UII		1	0	1	<bit3,bits13-< td=""></bit3,bits13-<>
Movi	L_	Pred	1	0	0	<u> </u>	18			لـــــــــــــــــــــــــــــــــــــ	L	R.			1	1	10>==UI5 POS
Jmp		Pred	1	0	1		SI9					0	PR		0	0	
Call	L	Pred	1	0	1		SI9	,	1112	!			UI2:		0	1	
Loop	L_	Pred	1	0	1	UI5:Lcount				:Lsi		0	PRI		1	0	
Jmpi	<u>L</u>	Pred	1	0	1	RX	X	X	X	X	X	1	PRI		+	0	
Calli	<u> </u>	Pred	1	0	1	RX	<u> </u>	_ X	X	:Lsi	LX.		UI2:		1	1	
Loopi	<u> </u>	Pred	1	0	1	RX	X	R		.LSI	76	PZ	<u> </u>	<u> </u>	+	-	
Test	<u> </u>	Pred	1	1	ó	RX			<u>'</u> UI5			P	, '	В	řó	1	
Testbit	<u> </u>	Pred	1		00	RX Pa	Pb		Po			PZ	-	&	ĭ	1	
Andp, orp	 	Pred	 		0	MX MX	1	R				Ext		- 0	Ö	Ö	
Load	 	Pred	1	1		MZ MZ	-	R				Ext		-	ŏ	Ö	
Store		Pred	1 +	 	+	MX MX	\vdash	R			1		1	0	Ö	ō	
eLoad	 	Pred Pred	++	1 +	1	MZ	 	R			1	1	1	1	Ō	0	
eStore	1	Pred	╁	+	1	1412	, F		27:10	6	<u>.</u>		احنصا		1	0	
Extended	 -	Pred	1	11	1	RX	T	RY	7RZ	<u> </u>	Rxt	Ryt	&.1.	&1.!	0	1	
Logic2	1	Pred	1	1	1	unit ereq			Z		qd	S	ft	0	1	1	
mov-erg Crb	1	Pred	1	1	1	RX RX	<u> </u>		Z		s/m		0	1	1	1	
Panty	1	Pred	11	1	1	RX		PZ		0/E		1	0	1	1	1	
Stm	十	Pred	十:	Ιi	1	MZ	1		X		1	1	0	1	1	1]
Abs	1	Pred	11	11	Ιi	RX			Z		0	0	-	1_	1	1	
Neg	十	Pred	11	11	1	RX		R	Z		0	1_	1	1	1	1]
Div-step	1	Pred	1	1	1	RX			Z		1	0	1	1	1	1	
Test&Set		Pred	1	1	1	RX		PZ		0	11	1	1_	1	11	1.1	
Reserved	I	Pred	11	1	11			0	0	1	11	1	1	1	11	나	1
Return	T	Pred	1	1	1	Pred I-ctl	0	1	0	_1_	11	1	1	1	1.1	-]-	-
Zero-ac	T	Pred			1	ac #	1	1	0	1	11	11	1	1	11	1-1-	4
eSync		Pred	1	1	1	RZ	0	11	1	1	11	1	1	1	 	1	-
Swi	L	Pred	1	11	11	<u>UI3</u> 0	1	11		1	1	1 1	1		1-1	+	4
Nop		Pred	11	11	1	<u>UI3 1</u>											J

FIG. 6F

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	Fill: Sign/ Zero	Bit 15 is continuation of inner LC	andp,orp, andorp, orandp, pz=(px relop py)
16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	UIS Position Imm10 rzł D U/S 1 Shift UIS A/L Lt R/L 0 Fill 1 x x x x 1 Shift UIS 1 x R/L 1 x 1	Ul4 inner Lsize Ul2 C-Ls Ul4 inner Lstart 0 Ul4 inner Lsize Ul2 C-Ls Ul4 inner Lstart 1 =/- RZ i/f rzh rzl s/u s/u 0 +/- RZ Lt rzh rzl x x 1	× 1 0 -
17 16 × 0		× × exit 0 0 0 0 ×	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
19 18 1	× × × × × × × × × ×	0 x exit 0 x exit 0 x exit 0 x x x	××
0 2	-00	000	00-0-0-0-1
20) 4 3 0 0	0 0 0	000	
alf (39 6 5 0	00 0	0000	00000000
Bits 13:2 of upper half (39:20 11 10 9 8 7 6 5 4 X RZ 0 0	RZ RZ RZ	Ul4 inner L RY RY RY	D PZ D PZ RX RX RX RX RX RZ RX RZ RX RZ RX RZ RX RX RX RX RX RX RX RX RX RX RX RX RX
13 12 R	Ul4 length RX RX	UIA outer LC RX RX RX RX	RX RX H/L Fill Type Type RX RX RX RX RX
Insert/Extract	Inserti Shift Rotate	jmp, call dloop dloopi mult	Reserved logicp Testi Movi loadi storet storet Addi/subi mini,maxi andi,on

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MAC: 39 38 37 36 35 34 33 32 31 30 29 28 27 26 25 24 23 22 21 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0 Group Pred opcode SX	PL PS Rnd S* DA V/S Lt +/- S* S* S* S* MUL-NOP PL PS Rnd S* DA V/S Lt +/- S* eregs MUL-ADD PL PS Gx S+ Rnd SA DA V/S Lt =/+ S* SA =/+ HL	37 36 35 34 33 32 31 30 29 28 27 26 25 24 23 22 21 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 10	27 26 25 24 23 22 21 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 SX	1 1 34 33 32 31 30 29 opcode
MAC: 39 38 37 36 35 34 33 33 Group Pred o -40-bit	2-20 ser 2-20 par res.	ARITH: 39 38 37 36 35 34 3. Group Pred	EXT: 39 38 37 36 35 34 3 Group Pred	<u>5</u>

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三	37 36 35 34 33 32 31 30 29 28 27 26 25 24 23 22 21 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 5	11 10 9 8 7 6 5 Imm20	11 10 9 8 7 6 5 Imm20	11 10 9 8 7 6 5 Imm20
			Pred 00000e	Fred opcode
22				
)))				
	2	2	,	
			2	2
				anordo nalu
			June 20000	Pred opcode
		pred	Pred	Pred opcode
	mm20	Imm20	Imm20	Imm20
	mm20	Imm20	Imm20	Imm20
0 0 7 0 8 0 11	11 10 3 10 17 10 3 mm20	Imm20	Imm20	Imm20
11 10 9 8 7 6 5	11 10 9 8 7 6 5 mm20	11 101 9 8 7 6 5 1 10 5 10 10 10 10	11 10 9 8 7 6 5 Imm20	11 10 9 8 7 6 5 Imm20
11 10 9 8 7 6 5	11 10 9 8 7 6 5	11 10 9 8 7 6 5 Imm20	11 10 9 8 7 6 5 1 1 1 1 1 1 1 1 1	11 10 9 8 7 6 5 Imm20
11 10 9 8 7 6 5	11 10 9 8 7 6 5 mm ²⁰	11 10 9 8 7 6 5 Imm20	11 10 9 8 7 6 5 Imm20	11 10 9 8 7 6 5 Imm20
11 10 9 8 7 6 5	11 10 9 8 7 6 5 mm20	11 10 9 8 7 6 5 Imm20	11 10 9 8 7 6 5 Imm20	11 10 9 8 7 6 5 Imm20
11 10 9 8 7 6 5	11 10 9 8 7 6 5 mm20	11 10 9 8 7 6 5 Imm20	11 10 9 8 7 6 5 Imm20	11 10 9 8 7 6 5 Imm20
11 10 9 8 7 6 5	11 10 9 8 7 6 5 mm20	11 10 9 8 7 6 5 Imm20	11 10 9 8 7 6 5 Imm20	11 10 9 8 7 6 5 Imm20
11 10 9 8 7 6 5	11 10 9 8 7 6 5 mm20	11 10 9 8 7 6 5 Imm20	11 10 9 8 7 6 5 Imm20	11 10 9 8 7 6 5 Imm20
11 10 9 18 17 16 15	11 10 9 8 7 6 5 mm20	11 10 9 8 7 6 5 Imm20	11 10 9 8 7 6 5 Imm20	11 10 9 8 7 6 5 Imm20
11 10 9 8 7 6 5	11 10 9 8 7 6 5 mm20	11 10 9 8 7 6 5 Imm20	11 10 9 8 7 6 5 Imm20	11 10 9 8 7 6 5 Imm20
11 10 9 8 7 6 5	11 10 9 8 7 6 5 mm20	11 10 9 8 7 6 5 Imm20	11 10 9 8 7 6 5 Imm20	11 10 9 8 7 6 5 Imm20
11 10 9 8 7 6 5	11 10 9 8 7 6 5 mm20	11 10 9 8 7 6 5 Imm20	11 10 9 8 7 6 5 Imm20	11 10 9 8 7 6 5 Imm20
11 10 9 8 7 6 5	11 10 9 8 7 6 5	11 10 9 8 7 6 5 Imm20	11 10 9 8 7 6 5 Imm20	11 10 9 8 7 6 5 Imm20
11 10 9 8 7 6 5	11 10 9 8 7 6 5	11 10 9 8 7 6 5 Imm20	11 10 9 8 7 6 5 Imm20	11 10 9 8 7 6 5 Imm20
11 10 9 8 7 6 5	11 10 9 8 7 6 5	11 10 9 8 7 6 5 Imm20	11 10 9 8 7 6 5 Imm20	11 10 9 8 7 6 5 Imm20
11 10 9 8 7 6 5	11 10 9 8 7 6 5	11 10 9 8 7 6 5 Imm20	11 10 9 8 7 6 5 Imm20	11 10 9 8 7 6 5 Imm20
11 10 9 8 7 6 5	11 10 9 8 7 6 5	11 10 9 8 7 6 5 Imm20	11 10 9 8 7 6 5 Imm20	11 10 9 8 7 6 5 Imm20
11 10 9 8 7 6 5	11 10 9 8 7 6 5	11 10 9 8 7 6 5 Imm20	11 10 9 8 7 6 5 Imm20	11 10 9 8 7 6 5 Imm20
11 10 9 8 7 6 5	11 10 9 8 7 6 5	11 10 9 8 7 6 5 Imm20	11 10 9 8 7 6 5 Imm20	11 10 9 8 7 6 5 Imm20
11 10 9 8 7 6 5	11 10 9 8 7 6 5	11 10 9 8 7 6 5 Imm20	11 10 9 8 7 6 5 Imm20	11 10 9 8 7 6 5 Imm20
11 10 9 8 7 6 5	11 10 9 8 7 6 5	11 10 9 8 7 6 5 Imm20	11 10 9 8 7 6 5 Imm20	11 10 9 8 7 6 5 Imm20
11 10 9 8 7 6 5	11 10 9 8 7 6 5	11 10 9 8 7 6 5 Imm20	11 10 9 8 7 6 5 Imm20	11 10 9 8 7 6 5 Imm20
11 10 9 8 7 6 5	11 10 9 8 7 6 5	11 10 9 8 7 6 5 Imm20	11 10 9 8 7 6 5 Imm20	11 10 9 8 7 6 5 Imm20
	11 10 9 8 7 6 5	11 10 9 8 7 6 5 Imm20	11 10 9 8 7 6 5 Imm20	11 10 9 8 7 6 5 Imm20
3000p 11 10 9 8 7 6 5	11 10 9 8 7 6 5	11 10 9 8 7 6 5 Imm20	Subop 11 10 9 8 7 6 5 1 1 1 1 1 1 1 1 1	Subop 11 10 9 8 7 6 5 1 1 1 1 1 1 1 1 1
Subop Subop 11 10 9 8 7 6 5	Subop Subop 11 10 9 8 7 6 5 6 5	Subop Subop 11 10 9 8 7 6 5 1 1 1 1 1 1 1 1 1	Subop 11 10 9 8 7 6 5 1 1 1 10 9 8 7 6 5	Subop 11 10 9 8 7 6 5 15 1mm20
Subop Subop 11 10 9 8 7 6 5	Subop Subop 11 10 9 8 7 6 5	Subop Subop 11 10 9 8 7 6 5 1 1 1 1 1 1 1 1 1	Subop Subop 11 10 9 8 7 6 5 1 1 1 1 1 1 1 1 1	Subop Subop 11 10 9 8 7 6 5 5 1 1 1 1 1 1 1 1
Subop Subop 11 10 9 8 7 6 5	Subop Subop 11 10 9 8 7 6 5	Subop 11 10 9 8 7 6 5 Imm20	Subop Subop 11 10 9 8 7 6 5 1 1 1 1 1 1 1 1 1	Subop 11 10 9 8 7 6 5 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
Subop Subop	Subop 5 5 5 5 5 5 5 5 5	Subop Subop	Subop Subop	Subop 5 5 5 5 5 5 5 5 5
Subop 0 5 5 1 1 1 1 1 1 1 1	Subop 0 3 3 4 4 4 4 4 4 4 4	Subop 0 3 3 4 4 5 5 5 5 5 5 5 5	Subop 0 3 3 4 4 4 4 4 4 4 4	Subop 0 3 5 5 5 5 5 5 5 5 5
Subop 8 7 6 5 5 5 5 5 5 5 5 5	11 10 9 8 7 6 5 Subop 11 10 9 8 7 6 5	Subop 8 7 6 5 1 1 1 1 1 1 1 1 1	11 10 9 8 7 6 5 Subop 11 10 9 8 7 6 5 Imm20	11 10 9 8 7 6 5 Subop 11 10 9 8 7 6 5 Imm20
11 10 9 8 7 6 5 Subop Subop 11 10 9 8 7 6 5	11 10 9 8 7 6 5 Subop Subop 11 10 9 8 7 6 5 Subop 12 13 14 15 15 15 15 15 15 15	11 10 9 8 7 6 5 Subop Subop 11 10 9 8 7 6 5 15 Imm20	11 10 9 8 7 6 5 Subop Subop 11 10 9 8 7 6 5 15 Imm20	11 10 9 8 7 6 5 Subop Subop 11 10 9 8 7 6 5 Tell 5
11 10 9 8 7 6 5 Subop Subop 11 10 9 8 7 6 5	11 10 9 8 7 6 5 Subop Subop 11 10 9 8 7 6 5 Mmm20	11 10 9 8 7 6 5 Subop Subop 11 10 9 8 7 6 5 15 Imm20	11 10 9 8 7 6 5 Subop Subop 11 10 9 8 7 6 5 15 Imm20	11 10 9 8 7 6 5 Subop Subop 11 10 9 8 7 6 5 Tuber 11 10 9 8 7 6 5 Tuber 11 10 9 8 7 6 5 Tuber 12 Tuber
11 10 9 8 7 6 5 Subop Subop 11 10 9 8 7 6 5	11 10 9 8 7 6 5 Subop Subop 11 10 9 8 7 6 5 15 Imm20	11 10 9 8 7 6 5 Subop Subop Subop 11 10 9 8 7 6 5 15 Imm20	11 10 9 8 7 6 5 Subop Subop 11 10 9 8 7 6 5 15 Imm20	11 10 9 8 7 6 5 Subop Subop 11 10 9 8 7 6 5 15 Imm20
11 10 9 8 7 6 5 Subop 11 10 9 8 7 6 5	11 10 9 8 7 6 5 Subop 11 10 9 8 7 6 5	11 10 9 8 7 6 5 Subop Subop 11 10 9 8 7 6 5 15 Imm20	11 10 9 8 7 6 5 Subop Subop 11 10 9 8 7 6 5 15 Imm20	11 10 9 8 7 6 5 Subop Subop 11 10 9 8 7 6 5 Tell 10 9 8 7 6 5 Tell 10 9 8 7 6 5 Tell 5
11 10 9 8 7 6 5 Subop Subop 11 10 9 8 7 6 5	11 10 9 8 7 6 5 Subop Subop 11 10 9 8 7 6 5	11 10 9 8 7 6 5 Subop Subop 11 10 9 8 7 6 5 Subop 11 10 9 8 7 6 5 Subop	11 10 9 8 7 6 5 Subop Subop 11 10 9 8 7 6 5 15 Imm20	11 10 9 8 7 6 5 Subop Subop 11 10 9 8 7 6 5 I
11 10 9 8 7 6 5 Subop Subop 11 10 9 8 7 6 5	11 10 9 8 7 6 5 Subop Subop 11 10 9 8 7 6 5	11 10 9 8 7 6 5 Subop Subop 11 10 9 8 7 6 5 15 Imm20	11 10 9 8 7 6 5 Subop Subop 11 10 9 8 7 6 5 15 Imm20	11 10 9 8 7 6 5 Subop 11 10 9 8 7 6 5 Tell 5
11 10 9 8 7 6 5 Subop Subop 11 10 9 8 7 6 5	11 10 9 8 7 6 5 Subop Subop 11 10 9 8 7 6 5	11 10 9 8 7 6 5 Subop Subop Subop 11 10 9 8 7 6 5 15 Imm20	11 10 9 8 7 6 5 Subop Subop 11 10 9 8 7 6 5 15 Imm20	11 10 9 8 7 6 5 Subop Subop 11 10 9 8 7 6 5 Tuber 11 10 9 8 7 6 7 6 7 6 7 6 7 6 7 6 7 6 7 6 7 6 7
11 10 9 8 7 6 5 Subop Subop 11 10 9 8 7 6 5	11 10 9 8 7 6 5 Subop Subop 11 10 9 8 7 6 5	11 10 9 8 7 6 5 Subop Subop 11 10 9 8 7 6 5 Subop 11 10 9 8 7 6 5 Subup 11 10 9 8 7 6 5 Subup 12 14 15 15 15 15 15 15 15	11 10 9 8 7 6 5 Subop Subop 11 10 9 8 7 6 5 I	11 10 9 8 7 6 5 Subop Subop 11 10 9 8 7 6 5 I
11 10 9 8 7 6 5 Subop Subop Subop 11 10 9 8 7 6 5	11 10 9 8 7 6 5 Subop 11 10 9 8 7 6 5 5 Mmm20	11 10 9 8 7 6 5 Subop Subop 11 10 9 8 7 6 5 15 Imm20	11 10 9 8 7 6 5 Subop Subop 11 10 9 8 7 6 5 15 Imm20	11 10 9 8 7 6 5 Subop Subop 11 10 9 8 7 6 5 15 Imm20
11 10 9 8 7 6 5 Subop Subop 11 10 9 8 7 6 5	11 10 9 8 7 6 5 Subop Subop 11 10 9 8 7 6 5	11 10 9 8 7 6 5 Subop Subop 11 10 9 8 7 6 5 15 Imm20	11 10 9 8 7 6 5 Subop Subop 11 10 9 8 7 6 5 15 Imm20	11 10 9 8 7 6 5 Subop Subop 11 10 9 8 7 6 5 15 Imm20
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MOV ADD SUB MAX AND OR Pred opcode SX Pred opcode SX SX SS 33 32 31 30 29 28 27 26 25 24 23 22 21 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 15 15 15 15 15 15	MOV ADD SUB MIN MAX AND OR Pred opcode SX Pred opcode SX SX SX SY SUB MIN MAX AND OR SY Subop SY Subop SY Subop SY Subop SY Subop SY Subop SY Subop SY Subop SY Subop SY Subop SY Subop SY Subop SY SUBOP SUBOP S	MOV ADD SUB MIN MAX AND OR Pred opcode SX S	MOV ADD SUB MIN MAX AND OR Pred opcode SX SX SX SX SX SX SX S	MOV ADD SUB MIN MAX AND OR 77 36 35 34 33 32 31 30 29 28 27 26 25 24 23 22 21 20 19 18 17 16 15 14 13 12 11 10 9 18 17 6 15 78 36 35 34 33 32 31 30 29 28 27 26 25 24 23 22 21 20 19 18 17 16 15 14 13 12 11 10 9 18 17 6 15 78 37 36 35 34 33 32 31 30 29 28 27 26 25 24 23 22 21 20 19 18 17 16 15 14 13 12 11 10 9 18 17 6 15 78 37 36 35 34 33 32 31 30 29 28 27 26 25 24 23 22 21 20 19 18 17 16 15 14 13 12 11 10 9 18 17 6 15 79 78 78 78 78 78 78 78 78 78 78 78 78 78
MOV ADD SUB MIN MAX AND OR OR SX AND OR SX AND ADD OR SX AND AND ADD SX AND AND ADD ADD AND ADD ADD AND ADD ADD	MOV ADD SUB MIN MAX AND OR AND OR AND OR AND OR SY AND ADD OR AND OR AND OR SY AND ADD OR SY AND	MOV ADD SUB MIN MAX AND OR Pred opcode SX AND OR SY SY SY SY SUB MAX AND OR SY SY SUB SY SY SY SY SUB SY SY SY SY SUB SY SY SUB SY SY SY SY SY SUB SY SY SUB SY SY SUB SY SY SUB SY SY SUB SY SY SUB SY SY SY SY SY SY SY SY SY SY	MOV ADD SUB MIN MAX AND OR Pred opcode SX 37 36 35 34 33 32 31 30 29 28 27 26 25 24 23 22 21 20 19 18 17 16 15 14 13 12 11 10 9 18 17 6 15 19 15 136 35 34 33 32 31 30 29 28 27 26 25 24 23 22 21 20 19 18 17 16 15 14 13 12 11 10 9 18 17 6 15 19 19 18 17 16 15 14 13 12 11 10 9 18 17 16 15 19 19 19 19 19 19 19 19 19 19 19 19 19	MOV ADD SUB MIN MAX AND OR 37 36 35 34 33 32 31 30 29 28 27 26 25 24 23 22 21 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 37 36 35 34 33 32 31 30 29 28 27 26 25 24 23 22 21 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 5 7 6 5 7 6 5 7 7 7 7 7 7 7 7 7
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opcode SX DZ SUD MOV ADD SUB MIN MAX AND OR AND OR SX SUB SX SY SY SY SY SY SY SY	opcode SX DZ SUB MOV ADD SUB MIN MAX AND OR AND OR SX SX SX SX SX SX SX S	opcode SX DZ Numbre MOV ADD SUB MIN MAX MAX AND OR OR OR SX AND OR 37 36 35 34 33 32 31 30 29 28 27 26 25 24 23 22 21 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 Subop 37 36 35 34 33 32 31 30 29 28 27 26 25 24 23 22 21 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 Subop	opcode SX DZ NBOV ADD SUB MIN MAX AND OR 37] 36[35] 34] 33[32] 31] 30[29] 28[27] 26[25] 24[23] 22 21[20] 19[18] 17] 16[15] 14[13] 12[11] 10[9] 8 7 6 5 Pred opcode SX Subop 37[36] 35 [34] 33[32] 31[30[29] 28[27] 26[25] 24[23[22] 21[20] 19[18] 17[16[15] 14[13] 12[11] 10[9] 8 7 6 5 37[36] 35 [34] 33[32] 31[30[29] 28[27] 26[25] 24[23[22] 21[20] 19[18] 17[16[15] 14[13] 12[11] 10[9] 8 7 6 5	opcode SX
opcode SX DZ SUB MOV ADD SUB MIN MAX AND OR AND OR SX SUB SX SY SY SY SY SY SY SY	opcode SX DZ SUB MOV ADD SUB MIN MAX AND OR AND OR SY SI SI SI SI SI SI SI	opcode SX DZ Subop ADD SUB MIN MAX AND OR 37 [36] 35 [34] 33 [32] 31 [30] 29 [28] 27 [26] 25 [24] 23 [22] 21 [20] 19 [18] 17 [16] 15 [14] 13 [12] 11 [10] 9 [8] 7 [6] 5 Pred opcode SX Subop 37 [36] 35 [34] 33 [32] 31 [30] 29 [28] 27 [26] 25 [24] 23 [22] 21 [20] 19 [18] 17 [16] 15 [14] 13 [12] 11 [10] 9 [8] 7 [6] 5 37 [36] 35 [34] 33 [32] 31 [30] 29 [28] 27 [26] 25 [24] 23 [22] 21 [20] 19 [18] 17 [16] 15 [14] 13 [12] 11 [10] 9 [8] 7 [6] 5	opcode SX DZ Numbrance ADD SUB MIN MAX AND OR 37] 36[35] 34] 33[32] 31] 30[29] 28[27] 26[25] 24[23] 22 21 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 Pred opcode 37] 36[35] 34 33[32] 31 30 29 28[27]26[25] 24[23]22 21 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5	opcode SX DZ Numbre MOV ADD SUB MIN MAX MAX AND OR AND OR AND 37] 36[35] 34 33[32] 31 [30 [29 [27] 26 [25 [24 [23] 22 21] 20 [19 [18 [17] 16 [15 [14 [13] 12 [11 [10] 9 [8 17 6 [5 5 24 [23] 22 21] 20 [19 [18 [17] 16 [15 [14 [13] 12 [11 [10] 9 [8 17 6 [5 5 24 [23] 22 21] 20 [19 [18 [17] 16 [15 [14 [13] 12 [11 [10] 9 [8 17 6 [5 5 24 [23] 22 21] 20 [19 [18 [17] 16 [15 [14 [13] 12 [11 [10] 9 [8 17 6 [5 5 24 [23] 22 21] 20 [19 [18 [17] 16 [15 [14 [13] 12 [11 [10] 9 [8 17 6 [5 5 24 [23] 22 21] 20 [19 [18 [17] 16 [15 [14 [13] 12 [11 [10] 9 [8 17 6 [5 5 24 [23] 22 21] 20 [19 [18 [17] 16 [15 [14 [13] 12 [11 [10] 9 [8 17 6 [5 5 24 [23] 22 21] 20 [19 [18 [17] 16 [15 [14 [13] 12 [11 [10] 9 [8 17 6 [5 5 24 [23] 22 21] 20 [19 [18 [17] 16 [15 [14 [13] 12 [11 [10] 9 [8 17 6 [5 5 24 [23] 22 21] 20 [19 [18 [17] 16 [15 [14 [13] 12 [11 [10] 9 [8 17 6 [5 5 24 [23] 22 [21 [20] 19 [18 [17] 16 [15 [14 [13] 12 [14 [14 [14 [14 [14 [14 [14 [14 [14 [14
opcode SX DZ Subop MOV ADD SUB MIN MAX AND AND OR OR AND OR SY AND AND OR SY AND AND OR SY AND AND AND AND OR SY AND	opcode SX DZ Subop MOV ADD SUB MIN MAX AND AND OR 37 36 35 34 33 32 31 30 29 28 27 26 25 24 23 22 21 20 19 18 17 16 15 14 13 12 11 10 9 18 17 6 15 18 17 16 15 14 13 12 11 10 9 18 17 6 15 13 13 13 13 13 13 12 12 12 12 12 12 12 12 19 18 17 16 15 14 13 12 11 10 9 18 17 16 15 18 17 16 15 14 13 12 11 10 19 18 17 16 15 15 15 15 15 15 15 15 15 15 15 15 15	opcode SX DZ Subop Imm10 MOV ADD SUB MIN MAX AND OR AND OR AND 37]36[35]34[33]32[31]30[29]28[27]26[25]24[23]22[21]20[19]18[17]16[15]14[13]12[11]10[9]8[7]6[5] SY DPz Subop 37]36[35]34[33]32[31]30[29]28[27]26[25]24[23]22[21]20[19]18[17]16[15]14[13]12[11]10[9]8[7]6[5] SY DPz Subop 37]36[35]34[33]32[31]30[29]28[27]26[25]24[23]22[21]20[19]18[17]16[15]14[13]12[11]10[9]8[7]6[5] Emm20	opcode SX DZ Subop Imm 10 ADD SUB MAX MAX MAX AND	opcode SX DZ Subop Imm 10 ADD SUB MIN MAX AND
11 10 9 8 7 6 5 Subop 11 10 9 8 7 6 5	opcode SX DZ Subop MOV ADD SUB MIN MAX AND AND OR 37 36 35 34 33 32 31 30 29 28 27 26 25 24 23 22 21 20 19 18 17 16 15 14 13 12 11 10 9 8 17 6 15 37 36 35 34 33 32 31 30 29 28 27 26 25 24 23 22 21 20 19 18 17 16 15 14 13 12 11 10 9 8 17 6 15	opcode SX DZ MoV ADD SUB MIN MIN MAX AND 37]36[35]34[33]32[31]30[29]28[27]26[25]24[23]22[21]20[19]18[17]16[15]14[13]12[11]10[9]8[7]6[5] 37]36[35]34[33]32[31]30[29]28[27]26[25]24[23]22[21]20[19]18[17]16[15]14[13]12[11]10[9]8[7]6[5] 37]36[35]34[33]32[31]30[29]28[27]26[25]24[23]22[21]20[19]18[17]16[15]14[13]12[11]10[9]8[7]6[5]	opcode SX DZ MOV ADD SUB MIN MAX AND OR 37] 36[35] 34 [33] 32[31] 30[29 [28] 27] 26[25] 24 [23] 22 [21] 20 [19] [18] 17] 16[15] 14 [13] 12 [11] 10[9] [8] 7 [6] 5 Pred opcode 37] 36[35] 34 [33] 32[31] 30 [29 [28] 27 [26] 25 [24] 23 [22] 21 [20] 19 [18] 17 [16] 15 [14] 13 [12] 11 [10] 9 [8] 7 [6] 5	opcode SX DZ MoV ADD SUB MIN MAX AND OR 37] 36[35] 34 33[32] 31 30[29 28[27]26[25]24 23]22 21 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 Pred opcode SX SX 37 36 35 34 33 30 29 28 27 26 25 24 23 22 21 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5
opcode SX DZ Subop MOV ADD SUB MIN MAX AND SUB MIN MAX AND OR Pred OR OR SY AND OR	opcode SX DZ Subop MOV ADD SUB MIN MAX 37] 36 35 34 33 32 31 30 29 28 27 26 25 24 23 22 21 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 37 36 35 34 33 32 31 30 29 28 27 26 25 24 23 22 21 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 34 33 32 31 30 29 28 27 26 25 24 23 22 21 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5	opcode SX DZ Subop MOV ADD SUB ADD SUB MIN MAX AND OR MAX AND OR MAX AND OR NAX AND OR	opcode SX DZ Subop MOV ADD SUB MIN MAX 37] 36[35] 34 [33] 32[31] 30[29] 28[27] 26[25] 24 [23] 22 [21] 20[19] 18 [17] 16[15] 14 [13] 12 [11] 10[9] 8 [7] 6 [5] 13 [25] 34 [33] 32[31] 30[29] 28[27] 26[25] 24 [23] 22 [21] 20[19] 18 [17] 16[15] 14 [13] 12 [11] 10[9] 8 [7] 6 [5] 17 [6] 5 37] 36[35] 34 [33] 32[31] 30[29] 28[27] 26[25] 24 [23] 22 [21] 20[19] 18 [17] 16[15] 14 [13] 12 [11] 10[9] 8 [7] 6 [5] 17 [6] 5	opcode SX DZ Subop MOV ADD SUB MIN MAX AND OR 37] 36[35] 34[33] 32[31] 30[29[28[27]26[25]24[23]22 21[20]19[18]17[16]15 14[13]12[11] 10[9]88 17 6[5] Pred opcode SX SX Subop Nax 37] 36[35] 34[33] 32[31] 30[29[28[27]26[25]24[23]22 21[20]19[18]17[16]15 14[13]12[11] 10[9]88 17 6[5] 6[5] 37] 36[35] 34[33] 32[31] 30[29[28[27]26[25]24[23]22[21[20]19[18]17[16]15]14[13]12[11] 10[9]88 17 6[5] 6[5] 37] 36[35] 34[33[32]31] 30[29[28[27]26[25]24[23]22[21[20]19[18]17[16]15]14[13]12[11] 10[9]88 17 6[5] 6[5] Pred opcode Imm20

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Always postupdate Always postupdate

ptr.p14,p15

Mem[ptr]|||ptr +=idx

SPR s0-s15

ac-names reserved

Mem[ptr + idx]

off

offset: U14

6-bit specifier DSP instructions

ptr. (ro) to (r15) off gpr. r0-r15

7-bit specifier Parallel Store, Parallel Load in DSP instructions

S

FIG. 61-1				·
Always postupdate				RISC instructions 20—bit DSP instructions 20—bit Shadow DSP instructions
5 4 3 2 1 0 W/R 0 0 ac-names 0 1 gpr. r0-r15 1 ptr. (r0) to (r15) off	ifier RISC instructions 4 3 2 1 0	0 spr: s0–s15 1 gpr: r0–r15	cifier 3 2 1 0	gpr: r0-r15 ptr: (r0-r7) off ereg

4-bit specifier

5-bit specifier

S 9

ω

idx1: UI3 (0-7) | xhrO:

B

26 | 25 | 24 | 23 |

27

29 30

δP

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ac-names

3	2	1	0			SPR:
<u> </u>	0	0	0	AO	(use type, SIMD)	gpr-type
0	_				(use type, esma)	•••
0	0	0	1	· A1		ereg type
0	0	1	0	T		fu-ctl
0	0	1	1	TR		pls-ctf
0	1	0	0	A00	(unit 0)	cb-ctl
0	1	0	1_	A10		loop-ctl
0	1	1	0	то		pcr
0	1	1	1	TR0		status
1	0	0	0	SX1		
1	0	0	1	SX1s		
1	0	1	0	SX2		
1	0	1	1	SX2s		
1	1	0	0	SY1		
1	1	0	1	SY1s		
1	1	1	0	SY2		
1	1	1	1	SY2s		1

ereg names

3	2	1	0			
0	0	0	0	AO		
0	0	0	1_	A1		
0	0	1	0	T		
0	0	1	1	TR		
0	1	0	0	PP0		
0	1	0	1	Aout		
0	1	1	0	PP1		
0	1	1	1	Dout		
1	0	0	0	SX1	FIG	6I-2
1	0	0	1	SX1s	1 10.	01-2
1	0	1	0	SX2		
1	0	1	1] SX2s	٠	
1	1	0	0] SY1		
1	1	0	1	SY1s		
1	1	1	0	SY2		
1	1	1	1	SY2s		
				-		

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